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GRPC and Protobuf(Proto)

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developed at Google. gRPC is a language neutral and platform neutral framework that allows users to write applications where independent

HTTP 1.1

What is the gRPC?

Rahul Sinha

services can work with each other as if they were native. It uses Protocol Buffers as the interface description language. HTTP2 is much faster and more reliable than HTTP1. HTTP1 loads a single request for every TCP connection, while HTTP2 avoids network delay by using multiplexing. HTTP is a network delay sensitive protocol in the sense that if there is less network delay, then the page loads faster.

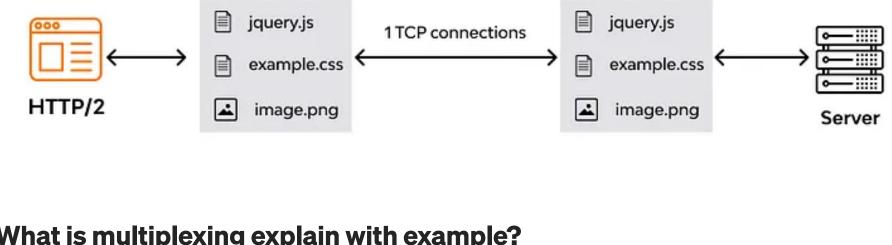
A general RPC (Remote Procedure Call) framework over HTTP/2, initially

Multiplexing 3 TCP connections

image.png

DEMUX

Server



What is multiplexing explain with example? Multiplexing is a technique used to combine and send the multiple data streams over a single medium. The process of combining the data streams is known as multiplexing and hardware used for multiplexing is known as a multiplexer.

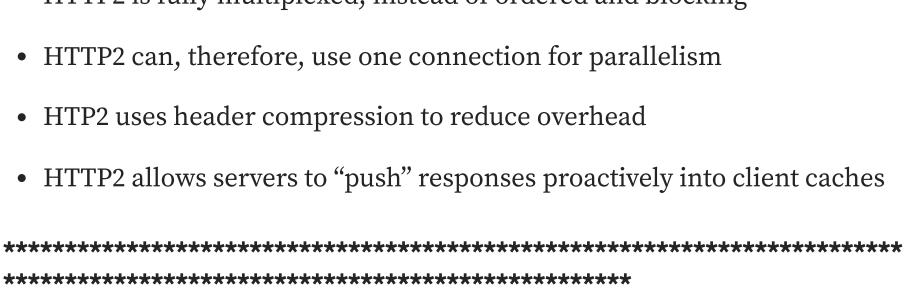
1 link, n channels

MUX

inputs

gRPC

These are the high-level differences between HTTP1 and HTTP2: HTTP2 is binary, instead of textual



• Uses protobuf (v3)

• Synchronous and asynchronous communication possible

• Binary protocol for data interchange

• Makes use of HTTP/2 as well

• Again from Google

• Framework for RPC calls

• Designed by Google • Uses generated "Struct" like description at client and server to un-/-

marshall message

• gRPC manages the way a client and a server can interact (just like a web

client/server with a REST API)

Protobuf or Proto:

JS Support Yes Yes No

and decoded

Highly expensive when

there are massive data

Hand parsing and

gRPC works at layers 5, 6 and 7. Protobuf works at layer 6.

Layer 6- Presentation Layer

format to transmit over the network.

1. What are the Benefits of gRPC?

< JSON

No

XML **JSON** Proto Human Readable Data Yes No Yes

Proto is smaller, simpler, faster and language neutral. You can see this

similar to JSON or XML but its smaller and faster compared to it.

Processing Speed

Interfaces For RPC

Validations

Cost

gRPC has 2 sides: a server side, and a client side, that is able to dial a server. The server exposes RPCs (ie. functions that you can call remotely). And you have plenty of options there: you can secure the communication (using TLS),

google protobuf and http/2 protocol which is Multiplexed, single tcp connection, transports data as binary, enables duplex streaming etc. • Duplex streaming: Allows clients side and service streaming simultaneously.

• High performance along with Safety: gRPC is high performance with

• Heavily optimized: gRPC library is under continuous benchmarks to ensure there are no speed regressions.

idle.

Happy coding:)

Http2

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Definitions, Serialization, and hands-on gRP...

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HTTP2 is fully multiplexed, instead of ordered and blocking

Protobuf (aka protocol buffers)

• Open source cross platform data format used to serialize structured data.

gRPC and Protobuf are 2 completely different things. Let me simplify:

• protobuf is just a serialization/deserialization tool (just like JSON)

- Yes No Browser consumable Yes Can be eavesdropped Can be eavesdropped Data Security Hard to robustly decode

and decoded

Highly expensive when

there are massive data

Hand parsing and

< Proto

No

without knowing the

schema

Yes

> JSON, XML

Less expensive

Validations are easy

Google protobuf or proto is just a mechanism for serializing structured data.

- Validations are required with Keywords Validations are required
- add authentication layer (using interceptors), ... You can use protobuf inside any program, that has no need to be client/server. If you need to exchange data, and want them to be strongly typed, protobuf is a nice option (fast & reliable). On network layer

When you say "message transfer", Protobuf is not concerned with the transfer itself.

The presentation layer is also called the Translation layer. The data from the

application layer is extracted here and manipulated as per the required

It only works at either end of any data transfer, turning bytes into objects.

images over a single stream (or really any mixed compressible content), you can turn off compression for the images. • Auto generated client code: With protoc we can easily generate the client code and server code.

• Connection Pool: We can create connection pool containing persistent

In this fast moving world every second even microseconds matters, so due to

Also gRPC is roughly 7 times faster than REST when receiving data & roughly

low latency, high speed, robustness, secure features of gRPC wins.

connection to server through managed channels with states connected or

• Selective message compression: If you are streaming mixed text and

• First Class Load Balancing: gRPC has built in library feature it can

intelligently pick which backend to send traffic to.

10 times faster than REST when sending data for this specific payload. This is mainly due to the tight packing of the Protocol Buffers and the use of HTTP/2 by gRPC.

Protobuf

Written by Rahul Sinha

<Software Engineer><Leaner> IIT Dhanbad graduate

http://linkedin.com/in/rahul-sinha-3b6a75153

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Proto

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Prerequisite

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